Answers to Week 10

- **Section 10.4**

1.
   (a) Convergent by AST; not Absolutely Convergent by LCT with \( \sum \frac{1}{n} \)
   (b) Divergent by Ratio Test
   (c) Absolutely Convergent by Ratio Test

2. \( a_{101} = \frac{3^{101}}{101!} \)
3. at least 500 terms

- **Section 10.5**

1.
   (a) \( ROC = 2, (-4, 0) \)
   (b) \( ROC = 1, [-1, 1] \)
   (c) \( ROC = \frac{1}{3}, \left[ \frac{2}{3}, \frac{4}{3} \right) \)
   (d) \( ROC = \infty, (-\infty, \infty) \)

2.
   (a) convergent
   (b) divergent
   (c) convergent

- **Section 10.6**

1.
   (a) \( \sum_{n=0}^{\infty} \frac{(-1)^nx^{2n+1}}{2n+1} \)
   (b) \( \sum_{n=1}^{\infty} \frac{n2^{n-1}}{2n+1} \)
   (c) \( \sum_{n=0}^{\infty} \frac{(-1)^n2x^{2n+2}}{2n+2} \)

2.
   (a) \( \sum_{n=0}^{\infty} \frac{(-1)^n}{4n+1} \)
   (b) at least 24 terms